

Checklist of the opisthobranchs (Mollusca: Gastropoda) from the Chilean coast deposited in the “Colección de Flora y Fauna Profesor Patricio Sánchez Reyes” from the “Pontificia Universidad Católica de Chile”

Catálogo de los opistobranquios (Mollusca: Gastropoda) de la costa Chilena depositados en la “Colección de Flora y Fauna Profesor Patricio Sánchez Reyes” de la Pontificia Universidad Católica de Chile

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ABSTRACT

The specimens of opisthobranch molluscs included in the “Colección de Flora y Fauna Profesor Patricio Sánchez Reyes”, housed in the Pontificia Universidad Católica de Chile have been examined. As result of this review, a checklist of 18 opisthobranch species (2 sacoglossans, 1 pleurobranchid and 15 nudibranchs) is given.

To date, a total of 75 opisthobranch species, arranged in 51 genera and 34 families, have been recorded in Chile. In this paper, the geographical distribution of the studied species is commented on and extended in some cases.

RESUMEN

Se han revisado los ejemplares de moluscos opistobranquios presentes en la “Colección de Flora y Fauna Profesor Patricio Sánchez Reyes”, depositada en la Pontificia Universidad Católica de Chile. Como resultado de dicha revisión, se presenta una lista de 18 especies de opistobranquios (2 sacoglossos, 1 pleurobránquido y 15 nudibranchios).

Hasta el momento, en Chile se han citado un total de 75 especies de opistobranquios, distribuidas en 51 géneros y 34 familias. En el presente trabajo se comenta y se amplía en algunos casos la distribución geográfica de las especies abordadas.

KEY WORDS: Opisthobranchia, Sacoglossa, Nudipleura, Pleurobranchoidea, Nudibranchia, Chilean coast.

PALABRAS CLAVE: Opisthobranchia, Sacoglossa, Nudipleura, Pleurobranchoidea, Nudibranchia, costa Chilena.

INTRODUCTION

Information on the opisthobranch molluscs from the Chilean coast goes back to records in the nineteenth

century and originates mainly from scientific expeditions of European origin and one of North-American origin,

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Table I. Main scientific expeditions in which opisthobranch species from the Chilean coast were collected.

Tabla I. Principales expediciones en las que se recolectaron opistobranquios en las costas chilenas.

Expedition	Country	Years	Author
Voyage autour du monde sur la corvette <i>La Coquille</i>	France	1822-1825	LESSON (1831)
Voyage dans l'Amérique Méridionale	France	1826-1833	D'ORBIGNY (1835-1846)
Voyage de l' <i>Astrolabe</i>	France	1826-1829	QUOY AND GAIMARD (1832)
The Vologe of HMS <i>Challenger</i>	Denmark	1873-1876	BERGH (1884)
Mission Scientifique du Cap Horn	France	1882-1883	ROCHEBRUNE AND MABILLE (1891)
Albatross	U.S.A.	1885-1888	DALL (1890)
Expedition of 2 years to the west coast of South America	Denmark	1893-1895	BERGH (1898a)
Swedish Antarctic Expedition	Sweden	1901-1903	ODHNER (1926)
Expedition Natural History	Great Britain	1901-1904	ELIOT (1907)
Expedition to Juan Fernández and Eastern Island	Sweden	1921	ODHNER (1921)
The Lund University Chile Expedition	Sweden	1948-1949	MARCUS (1959)

which also yielded general collections of various taxonomic groups.

The results of these expeditions have been published as checklists and descriptions of molluscs in various journals and books, including descriptions of about 60 species, several of which were described for the first time (see Table I). Other publications not specifically devoted to opisthobranch molluscs but dealing with some Chilean species are PÖPPIG (1829), GOULD (1852), CUNNINGHAM (1871), ABRAHAM (1877), PFEFFER (1886), DALL (1889; 1909), PLATE (1894), PILSBRY (1895), STREBEL (1905), POWELL (1951) and REHDER (1980).

The opisthobranchs of South-America need a detailed revision, because until now most species have been described on the basis of preserved material, sometimes with a single reference specimen, and in many cases only as to their external morphology. Moreover, many of these descriptions are fragmentary or ambiguous.

In recent years, interest in the opisthobranch molluscs of South-America has revived, and several faunistic and taxonomic studies have been published, mostly based on the study of living material and mainly concerning opisthobranch species of the Chilean coast (MILLEN, SCHRÖDL, VARGAS AND INDACOCHA, 1994; SCHRÖDL, 1996a; b,

1997a; b; c, 1999a; b; c, 2000a; b; c, 2001, 2003; MUÑOZ, VALDÉS AND ORTEA, 1996; FISCHER AND ORTEA, 1997; FISCHER, CERVERA AND ORTEA, 1997; VALDÉS AND GOSLINER, 2001; VALDÉS, 2002; VALDÉS AND MUNIAÍN, 2002; FISCHER AND CERVERA, 2005; FISCHER, VAN DER VELDE AND ROUBOS, 2005; SCHRÖDL, ALARCÓN, BEDRIÑANA, BRAVO, BUSTAMANTE, CARVALHO, FÖRSTERRA, GALLARDO, HÄUSERMANN AND SALMEN, 2005).

Some of the species reported for the Chilean coast have also been recorded from the Antarctic coast (WÄGELE, 1990; 1995; CATTANEO-VIETI, 1991; GARCÍA, TRONCOSO, GARCÍA-GÓMEZ AND CERVERA, 1993) and from Argentina (MUNIAÍN, ORTEA AND RODRÍGUEZ, 1991; MUNIAÍN, VALDÉS AND ORTEA, 1996; SCHRÖDL, 1996b) and Peru (D'ORBIGNY, 1837; MILLEN *ET AL.*, 1994; SCHRÖDL, 1996b).

In 1960 Professor Patricio Sánchez Reyes, from the Pontificia Universidad Católica de Chile, in Santiago de Chile, founded the Room for Systematics ("la Sala de Sistemática") where biological material collected from several field expeditions was deposited. After his decease in 1999, and in recognition of his exhaustive work, this systematic room was named "Colección de Flora y Fauna Profesor Patricio Sánchez Reyes".

In this paper we study the opisthobranch material gathered from the Chilean coast between 1960 and 1971, present in this institution. It has not been studied until now, due to a lack of Chilean specialists.

MATERIAL AND METHODS

Specimens were identified by studying their external morphology as well as their anatomy. Results were compared with descriptions in the literature. Information about the collection localities of the material along the Chilean coast and

the geographic distribution of the species has been included.

The classification follows recent and comprehensive studies of the phylogeny of various opisthobranch groups (JENSEN, 1996, 1997; WÄGELE AND WILLAN, 2000; SCHRÖDL, WÄGELE, AND WILLAN, 2001; VALDÉS AND GOSLINER, 2001; VALDÉS, 2002). According to modern insights in phylogenetic classification, taxa higher than 'family' have been not assigned to a taxonomic category (DE QUEIROZ AND GAUTHIER, 1994) but the hierarchical structure of the classification has been maintained.

RESULTS

Opisthobranchs of the Chilean coast are distributed over five higher taxa according to the new classifications: Cephalaspidea, Aplysiomorpha, Sacoglossa, Tylodinoidea and Nudi-

pleura (see Table II). Among our material, we only identified species belonging to Sacoglossa and Nudi-pleura, as will be described in the following list.

OPISTHOBRANCHIA

SACOGLOSSA Von Ihering, 1876

Family PLAKOBRANCHIIDAE Gray, 1840

Genus *Elysia* Risso, 1818

Elysia hedgpethi Marcus, 1961

Material: Los Molles (32° 15' S; 71° 30' W), four specimens (N° SSUC-729). Duao, X región (34° 55' S; 71° 33' W), one specimen (N° SSUC-612).

Previous records from Chile: SCHRÖDL (1996a): Seno Otway (53° 07' S; 71° 22' W), Fuerte Bulnes (53° 39' S; 70° 56' W), Bay of Mansa (53° 32' S; 70° 55' W) in the South of Chile. The present material is the first record from the central coast of Chile.

General distribution: Also known from Tomales Bay (California) (MARCUS, 1961) and from Vancouver Island (MILLEN, 1980) to Bahía de los Angeles and Bahía de San Quintín (Baja California, Mexico) (BEHRENS, 1991).

Family HERMAEIDAE H. Adams and A. Adams, 1854

Genus *Aplysiopsis* Deshayes, 1839/1853 non Bergh, 1872

Aplysiopsis brattströmi Marcus, 1959

Material: La Portada, Bay of Antofagasta (23° 38' S; 70° 31' W), one specimen (N° SSUC-2608).

Previous records from Chile: Marcus (1959): Antofagasta (type locality); SCHRÖDL

(1996a) recorded this species from the central and southern Chilean coast: Bay of

Coliumo (36° 32' S; 72° 57' W), Fuerte Bulnes, extending its geographic distribution significantly towards the south.

General distribution: Also known from Comodoro Rivadavia, Patagonia Argentina (MUNIAIN, 1997).

NUDIPLEURA Wägele and Willan, 2000
PLEUROBRANCHOIDEA Férussac, 1822
Family PLEUROBRANCHIDAE Férussac, 1822
Genus *Berthella* Blainville, 1824
Berthella platei (Bergh, 1898)

Material: Los Molles, two specimens (N° SSUC-183). Poza Arrecifes, Los Molles, one specimen, (N° SSUC-470). El Tabo (33° 27' S; 71° 38' W), one specimen (N° SSUC-32).

Previous records from Chile: BERGH (1898a): Quirina; ODHNER (1926): Gulf of Reloncaví (41° 44' S; 72° 55' W), Punta Pelluco (41° 30' S; 72° 53' W), North from Bay of Quellín (41° 51' S; 72° 55' W), South from Gulf of Ancud (42° 26' S; 72° 59' W); BurdwoodBank (53° 45' S; 61° 10' W); MARCUS (1959): Bay of Calbuco (41° 56' S; 73° 08' W), North from

Gulf of Ancud, between Tres Cruces and Punta Piedras (41° 50' S; 73° 28' W); SCHRÖDL (1999): Island Picton, Beagle Channel, Lenca, Bay of Reloncaví; SCHRÖDL ET AL. (2005): Comau Fjord (42° 05' /42° 30' S; 72° 37' /72° 21' W).

General distribution: This species has not been reported outside the Chilean coast.

NUDIBRANCHIA Blainville, 1814
Family POLYCERIDAE Alder and Hancock, 1845
Genus *Thecacera* Fleming, 1828

Thecacera darwini Pruvot-Fol, 1950

Material: Coliumo, Los Morros (36° 29' S; 72° 58' W), three specimens (N° SSUC-1102), three specimens (N° SSUC-1109). Caleta Leandro, Tumbes (36° 37' S; 73° 07' W), two specimens (N° SSUC-1538).

Previous records from Chile: PRUVOT-FOL (1950): Bay of Naranja, Islote Hoste (55° 10' S; 69° 20' W); MARCUS (1959): Chiloé-North, Punta Ahui (41° 49' S; 73° 51' W), Islote de Chonos (45° 00' S; 74° 00' W); SCHRÖDL (1996a; 2003): Juan López (23° 30' S; 70° 32' W), Bay Inglesa (27° 07' S; 70° 53' W), Los Hornos, Coquimbo (29° 38' S; 71° 29' W), Pichidangui (32° 08' S; 71° 33' W), Bay of Coliumo; SCHRÖDL (2003): Seno Ventisquero (44° 30' S; 72° 35' W); SCHRÖDL ET AL. (2005): Comau Fjord (42° 05' /42° 30'

S; 72° 37' /72° 21' W); FISCHER ET AL. (2005): Bay of Antofagasta (23° 29' S; 70° 25' W), Bay of La Herradura (29° 58' S; 71° 22' W), Bay Tongoy, Coquimbo (30° 15' S; 71° 30' W), Bay Horcón, Valparaíso (33° S; 71° W); Las Cruces, Valparaíso (33° 29' S; 71° 38' W); Bay Hueihue, Ancud, Chiloé (41° 54' S; 73° 31' W); Bay Putemún, Castro, Chiloé (42° 25' S; 73° 45' W).

General distribution: This species has not been recorded outside the Chilean coast.

Family Chromodorididae Bergh, 1891
Genus *Cadlina* Bergh, 1878
Cadlina sparsa (Odhner, 1922)

Material: Coliumo, Los Morros, one specimen, 29 mm in length (N° SSUC-1102).

Previous records from Chile: ODHNER (1922): Archipelago of Juan Fernández (33° 37' S, 78° 53' W); MARCUS (1959): Bay of Quetalmahue (41° 50' 40' S; 73° 57' 10' W); SCHRÖDL (1996a; 2003): Bay of Coliumo; SCHRÖDL *ET AL.* (2005):

Comau Fjord (42° 05'/42° 30' S; 72° 37'/72° 21' W).

General distribution: This species is also known from California (JAECKLE, 1984; BEHRENS, 1991) and Argentina (SCHRÖDL, 2000b, 2003).

Genus *Tyrinna* Bergh, 1898

Tyrinna nobilis Bergh, 1898

Material: Iquique (20° 12' S; 70° 10' W), two specimens (N° SSUC-3334).

Previous records from Chile: BERGH (1898a), ODHNER (1921): Juan Fernández Island; Pajargo Island (probably Pájaros Island); MARCUS (1959): Strait of Chacao (41° 46' S; 73° 45' W), Punta de Tenaún (42° 20' 50" S; 73° 22' 00" W) and Bay of Calbuco; SCHRÖDL (1996a): Bay of Coliumo, Faro Corona (41° 50' S; 73° 50' W), Seno Ventisquero (44° 30' S; 72° 35' W); SCHRÖDL AND MILLEN (2001): Beach Los Piqueros (26° 12' S; 70° 39' W), Los Hornos, Pichidangui (32° 08' S; 71° 33'

W), Bay of Coliumo, Lenca (41° 40' S; 72° 40' W); SCHRÖDL (2003): Strait of Magellan, Chilean Patagonia to Los Hornos (northern Chile) and Juan Fernández Islands; SCHRÖDL *ET AL.* (2005): Comau Fjord (42° 05'/42° 30' S; 72° 37'/72° 21' W).

General distribution: This species is also known from several localities in Argentinian Patagonia (MUNIAÍN *ET AL.*, 1996; SCHRÖDL, 1996a, 2003; SCHRÖDL AND MILLEN, 2001).

Family DORIDIDAE Rafinesque, 1815

Genus *Doris* Linnaeus, 1758

Doris fontainei d'Orbigny, 1837

Material: Mehuín (39° 26' S; 73° 12' W), one specimen (N° SSUC-2129). Poza Verde, Coliumo, one specimen (N° SSUC-1141). Punta Moquehua, Caleta Mansa, five specimens (No. SSUC-5313). Chiloe (43° 00' S; 74° 00' W), one specimen (N° SSUC-5411).

Previous records from Chile: D'ORBIGNY (1835-1846): Southern Montemar, northern of Valparaíso (32° 57' 24" S; 71° 33' 25" W); ODHNER (1926): Coquimbo, Puerto Montt (41° 28' S; 72° 57' W) and Dichato (36° 33' S; 72° 56' W); MARCUS (1959): Los Molles; SCHRÖDL (1996a): Bay of Coliumo, Seno Ventisquero. SCHRÖDL (2003): from Chilean Patagonia to Arica (northernmost of Chile) (18° 25' S; 70° 16' W); SCHRÖDL *ET AL.* (2005): Comau Fjord (42° 05'/42° 30' S; 72° 37'/72° 21' W).

General distribution: Also known from Argentina: Northern Argentina

(ODHNER, 1926); and Patagonian shores (SCHRÖDL, 1996a; VALDÉS AND MUNIAÍN, 2002). Moreover, SCHRÖDL (2003) supports its presence in the Peruvian coast.

Remarks: *Doris fontainei* has been recently reported from the coasts of Argentina and Chile under different names (MUNIAÍN *ET AL.*, 1991; SCHRÖDL, 1996a; 1997b; 2000c). But, according to VALDÉS AND MUNIAÍN (2002), the correct specific name for this species should be *D. fontainei*. Recently, SCHRÖDL (2003) transferred this species to the genus *Archidoris* based on the absence of an acrembolic penis as described for the

Table II. Opisthobranch species recorded from the Chilean coast. Taxa higher to Family level are not assigned to any category, as explained in the text. Species included in our material are marked with an asterisk.

Higher Taxa	Families	Genera	Species
CEPHALASPIDEA S.L ¹	Acteonidae	<i>Acteon</i>	<i>A. delicatus</i> Dall, 1889
			<i>A. curtulus</i> Dall, 1889
	Diaphanidae	<i>Diaphana</i> <i>Toledonia</i>	<i>A. vagabundus</i> Rochebrune and Mabille, 1891
			<i>D. paessleri</i> Strebel, 1905
<i>T. limnaeaeformis</i> (Smith, 1879)			
Scaphandridae	<i>Scaphander</i>	<i>S. interruptus</i> Dall, 1890	
APLYSIOMORPHA	Aglajidae	<i>Aglaja</i>	<i>A. maculata</i> (d'Orbigny, 1837)
	Aplysiidae	<i>Aplysia</i> <i>Dolabella</i>	<i>A. parvula</i> Bergh, 1898
			<i>D. auricularia</i> (Lightfoot, 1786)
	Dolabriferidae	<i>Dolabrifera</i>	<i>D. dolabrifera</i> (Rang, 1828)
	SACOGLOSSA	Juliidae	<i>Julia</i> <i>Berthelinia</i>
<i>B. pseudochloris</i> Kay, 1964			
Oxynoacea	Plakobranthidae	<i>Elysia</i>	* <i>E. hedgpathi</i> Marcus, 1961
			* <i>A. brattströmi</i> Marcus, 1959
			<i>Limapontia</i> sp.
Plakobranthaceae	Hermoeidae	<i>Aplysiopsis</i>	<i>E. evelinae</i> Marcus, 1959
	Limapontidae	<i>Limapontia</i> <i>Ercolania</i>	<i>U. umbraculum</i> (Lightfoot, 1786)
TYLODINOIDEA	Umbraculidae	<i>Umbraculum</i>	
NUDIPLEURA	Pleurobranchidae	<i>Berthella</i> <i>Berthellina</i> <i>Pleurobranchaea</i>	* <i>B. platei</i> (Bergh, 1898)
			<i>B. citrina</i> (Rüppel and Leuckart, 1828)
			<i>P. maculata</i> (Quoy and Gaimard, 1832)
Nudibranchia			
Anthobranchia			
Doridoidea			
"Phanerobranchia" ³	Onchidorididae	<i>Acanthodoris</i>	<i>A. falklandica</i> Eliot, 1907
	Goniodorididae	<i>Okenia</i>	<i>O. angelensis</i> Lance, 1966
			<i>O. luna</i> Millen, Schrödl, Vargas and Indacochea, 1994
		<i>Ancula</i>	<i>A. fuegiensis</i> Odhner, 1926
	Corambidae ⁴	<i>Corambe</i>	<i>C. lucea</i> Marcus, 1959
	Polyceridae	<i>Kaloplocamus</i> <i>Holoplocamus</i> <i>Polycera</i>	<i>K. maculatus</i> (Bergh, 1898)
			<i>H. papposus</i> Odhner, 1926
			<i>P. priva</i> Marcus, 1959
			<i>P. alabe</i> Collier and Farmer, 1964
		<i>Thecacera</i>	* <i>T. darwini</i> Pruvot-Fol, 1950
Cryptobranchia	Chromodorididae ⁵	<i>Cadlina</i>	* <i>C. sparsa</i> (Odhner, 1922)
		<i>Tyrinna</i>	* <i>T. nobilis</i> Bergh, 1898
	Dorididae	<i>Doris</i> / <i>Neodoris</i>	* <i>D. fontainei</i> d'Orbigny, 1837
			* <i>D. kerguelensis</i> (Bergh, 1884)
			<i>Doris</i> sp. 1
			<i>N. claurina</i> Marcus, 1959 <i>incertae sedis</i>
	Discodorididae ⁶	<i>Geitodoris</i> <i>Baptodoris</i> <i>Gargamella</i> <i>Diaulula</i>	<i>G. patagonica</i> Odhner, 1926
			* <i>B. peruviana</i> (d'Orbigny, 1837)
			* <i>G. immaculata</i> Bergh 1894
			<i>D. hispida</i> (d'Orbigny, 1837)
			* <i>D. punctulata</i> (d'Orbigny, 1837)
			* <i>D. variolata</i> (d'Orbigny, 1837)
		<i>Rostanga</i>	* <i>R. pulchra</i> MacFarland, 1905

Tabla II. Opisthobranchios citados en la costa chilena. No se asignan taxones a categorías superiores a familia, tal y como se explica en el texto. Las especies incluidas en nuestro material se indican con un asterisco.

Higher Taxa	Families	Genera	Species
Dexiarchia ⁷			
Cladobranchia			
Dedronotoidea	Tritoniidae	<i>Tritonia</i>	<i>T. challengeriana</i> Bergh, 1884 <i>T. vorax</i> (Odhner, 1926) * <i>T. odhneri</i> Marcus, 1959 <i>Tritonia</i> sp. 1
	Dendronotoidea	<i>Dendronotus</i>	<i>Dendronotus</i> sp.
	Dotoidea	<i>Doto</i>	* <i>D. uva</i> Marcus, 1955
	Hancockidae	<i>Hancockia</i>	<i>H. schoeferti</i> Schrödl, 1999
	Phylliroidea	<i>Phylliroe</i>	<i>P. bucephala</i> Pèron and Lesueur, 1810
Arminoidea	Arminidae	<i>Armina</i>	<i>A. cuvieri</i> (d'Orbigny, 1837)
	Proctonotidae	<i>Janolus</i> ⁸	<i>J. rebecca</i> Schrödl, 1996 <i>J. chilensis</i> Fischer, Cervera and Ortea, 1997
Aeolidoidea	Flabellinidae	<i>Flabellina</i>	<i>F. falklandica</i> Eliot, 1907 <i>Flabellina</i> sp. 1 <i>Flabellina</i> sp. 2
	Tergipedidae	<i>Cuthona</i>	<i>C. georgiana</i> (Pfeffer in Martens and Pfeffer, 1886) <i>C. pusilla</i> (Bergh, 1898) <i>C. odhneri</i> Marcus, 1959 <i>C. valentini</i> (Eliot, 1907) <i>Cuthona</i> sp. 1 <i>Cuthona</i> sp. 2
	Eubranichidae	<i>Eubranchus</i>	<i>E. agrilus</i> Marcus, 1959 <i>Eubranchus</i> sp. 1 <i>Eubranchus</i> sp. 2
	Tergipedidae	<i>Tergipes</i>	<i>T. valentini</i> (Eliot, 1907)
	Facelinidae	<i>Facelina</i> <i>Phidiana</i>	<i>F. cyanella</i> (Couthouy in Gould, 1852) <i>insertae sedis</i> * <i>P. lottini</i> (Lesson, 1831) <i>P. patagonica</i> (d'Orbigny, 1837) <i>G. atlantica</i> Forster, 1777
	Glaucidae	<i>Glaucus</i>	* <i>A. papillosa</i> (Linnaeus, 1761)
	Aeolidiidae	<i>Aeolidia</i>	<i>A. collaris</i> Odhner, 1922 * <i>F. pinnata</i> (Eschscholtz, 1831)
	Fionidae	<i>Fiona</i>	

¹ In view of the analyses of MIKKELSEN (1996; 2002) and the molecular analyses of GRANDE, TEMPLADO, CERVERA AND ZARDOYA (2004a; b) it seems clear that this taxon is paraphyletic, although we used it in the present study because the phylogenetic relations between the different groups are still not definitively established.

² There are three species of Pleurobranchioidea reported from Chile, but only *Berthella platei* is reported in this study, and is the only one occurring in both the Magellanic and Peruvian provinces. Two other pleurobranchid species, *Berthellina citrina* (Rüppell and Leuckart, 1828) and *Pleurobranchaea maculata* (Quoy and Gaimard, 1823) have been recorded from the Chilean coast, but they are restricted to Easter Island and the Juan Fernández Islands, respectively. However, both records should be considered very doubtful according to MARCUS AND GOSLINER (1984), SCHRÖDL (1996a) and CERVERA, GOSLINER AND GARCÍA-GÓMEZ (1999).

³ Recent studies support the non-monophyly of Phanerobranchia (THOLLESSON, 1999; WOLLSCHIED AND WÄGELE, 1999; WOLLSCHIED-LENGELING, BOORE, BROWN AND WÄGELE, 2001; VALDÉS, 2002; WÄGELE, VONNEMANN AND WÄGELE, 2003; GRANDE, TEMPLADO, CERVERA AND ZARDOYA, 2004a, b; FAHEY AND GOSLINER, 2004) although a deep phylogenetic analysis of this taxon is still lacking.

⁴ SCHRÖDL AND WÄGELE (2001) have recently clarified the systematic position of the Family Corambidae and redescribe the Chilean species *Corambe luca* Marcus, 1959.

Table II. Continuation.

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- ⁵ In Chile the Chromodorididae are represented by two genera, each one with one species: *Cadlina sparsa* and *Tyrinna nobilis*. Another nominal chromodoridid species, *Chromodoris juvenca* Bergh, 1898 was attributed to the genus *Cadlina* by MARCUS (1959) and SCHRÖDL (1996a). However, this species is currently considered as a junior synonym of *T. nobilis* (SCHRÖDL, 2000b, 2003; SCHRÖDL AND MILLEN, 2001). Thus, the only valid species of *Cadlina* in Chile appears to be *C. sparsa*.
- ⁶ After the recent revision and phylogenetic study of the dorid criptobranchs VALDÉS (2002) considered the Families Platydorididae, Baptdorididae and Diaululidae as synonyms of the Family Discodorididae. Consequently, the genera *Baptdoris*, *Gargamella* and *Diaulula* must be included within the family Discodorididae.
- ⁷ Dexiarchia Schrödl, Wägele and Willan, 2001 is a Nudibranchia clade recently erected, which includes the Doridoidea, Dendronotoidea, Aeolidioidea and Arminoidea.
- ⁸ There are two valid species at the Chilean coast, *Janolus rebecca* Schrödl, 1996 and *J. chilensis* Fischer, Cervera and Ortea, 1997. A posterior comparative study of both species let us see that they are different species (Fischer, Schrödl and Cervera, unpublished data).

genus *Doris*. In the genus *Archidoris* the prostate gland is reduced or absent, whereas in *Doris fontainei* it is well developed, which agrees with the genus

Doris in general. Nevertheless, in this study, we consider that based on most of the morphological characters it belongs to the genus *Doris*.

Doris kerguelenensis (Bergh, 1884)

Material: Island Nueva, Magallanes (55° 15' S; 66° 32' W), one specimen (N° SSUC-5155).

Previous records from Chile: BERGH (1884): Puerto Otway (Chilean Patagonia); BERGH (1898a): Bay Tumbes and Punta Arenas; ODHNER (1926): Punta Arenas, Puerto Sofía, River Condor, Tierra del Fuego, Puerto Harris; MARCUS, 1985: 61° 15' S; 55° 05' W; SCHRÖDL (1996a): Bay Posesión (52° 13' S; 69° 17' W).

Distribution: Also known from Royal Sound and Morbihan Bay, Kerguelen Islands (BERGH, 1884; VICENTE, 1974); Almirante Buck, Antarctic Territory (VAYSSIÈRE, 1917); South Georgias, South from Falklands Islands, Ushuaia (Argentina) (ODHNER, 1926); MCMURDO Sound, Antarctic Territory (ODHNER,

1934); Davis Sea, Antarctic Territory (MINICHEV, 1972); Macquarie and Heard Islands (BURN, 1973); Scotia Sea (GARCÍA ET AL., 1993); Wedell Sea, Antarctic Peninsula and South Georgias (WÄGELE, 1990); New Caledonia (VALDÉS, 2001).

Remarks: VALDÉS (2002) has argued that *Austrodoris* is synonymous with *Doris*. Accordingly, the species *Austrodoris kerguelenensis* should be denominated *Doris kerguelenensis* and be included within the Dorididae, as was also suggested by SCHRÖDL (1996a). Recently, however, SCHRÖDL (2003) referred to this species as *Austrodoris kerguelenensis* overlooking the statement of VALDÉS (2002).

Family DISCODORIDIDAE Bergh, 1891

Genus *Baptdoris* Bergh, 1884

Baptdoris peruviana (d'Orbigny, 1837)

Material: Iquique (20° 12' S; 70° 10' W), three specimens (N° SSUC-3332). La Portada, Antofagasta, three specimens (N° SSUC-2607). South-East of the Mejillones Peninsula (23° 20' S; 70° 34' W), twelve specimens, (N° SSUC-3032). Los Molles, three specimens (N° SSUC-183).

Previous records from Chile: Isla Pájaros (BERGH, 1898); Valparaíso, (DALL, 1909).

General distribution: This species is also known from Peru: San Lorenzo (D'ORBIGNY, 1837) to Pucasana (SCHRÖDL, 1996a). Its record from Galápagos Islands (PILSBRY AND VANATTA, 1902) has been considered dubious (FISCHER AND CERVERA, 2005) and not considered here.

Remarks: The nominal species *Doris peruviana* d'Orbigny, 1837 was transferred to the genus *Platydoris* by Schrödl (2003), considering *P. punctatella* Bergh, 1898 as a junior synonym. DORGAN, VALDÉS AND GOSLINER (2002)

were not able to assign a generic name to *P. punctatella* on the basis of the original description by BERGH (1898), but using the photograph of a living animal in SCHRÖDL (1996a), they stated that it is not a *Platydoris* species. FISCHER AND CERVERA (2005) agree with this view. Thus, since the type material of *D. peruviana* cannot be located, these authors compare specimens of a doridoidean species from Iquique to Los Molles (Chilean coast) with the holotype of *P. punctatella*, and conclude that both are conspecific and, according to the radular teeth features, belong to the genus *Baptodoris* rather than *Platydoris*.

Genus *Gargamella* Bergh, 1894

Gargamella immaculata Bergh, 1894

Material: Cabo Metalqui, Chiloé (41° 50' 30" S; 73° 28' 30" W), two specimens (N° SSUC-3899).

Previous records from Chile: ODHNER (1926): Ultima Esperanza, Tierra del Fuego (53° 00' S; 69° 20' W); MARCUS (1959): Cabo de San Antonio (53° 55' S; 70° 52' W), Cabo Delgado (50° 06' S; 74° 55' W), Gulf of Ancud, between Quenu and Islote de Calbuco (41° 48' 50" S, 73° 09' 40" W); SCHRÖDL (1996a): Seno Otway, Queule (39° 23' S; 73° 13' W), Bay of Coliumo. This is a common species from the southern Chilean coast.

General distribution: Also recorded from Northern Argentina (BERGH, 1894;

ODHNER, 1926), as well as the Argentinian Patagonia and the Burdwood Bank (ODHNER, 1926; SCHRÖDL, 2003). The records from Peru, Southern Africa and New Zealand by ZAGAL AND HERMOSILLA (2001) are considered erroneous (SCHRÖDL, 2003).

Remarks: SCHRÖDL (1996a) included this species erroneously in the family Kentrodorididae, but recently VALDÉS (2002) transferred it again to the family Discodorididae.

Genus *Diaulula* Bergh, 1878

Diaulula punctuolata (d'Orbigny, 1837)

Material: Los Molles, two specimens (No. SSUC-183). Mehuín, one specimen (N° SSUC-2129). Punta Moquehua, Caleta Mansa, eleven specimens (N° SSUC-5278).

Previous records from Chile: D'ORBIGNY (1835-1846): Valparaíso (33° 02' S; 71° 38' W); BERGH (1898a): Bay Talcahuano (36° 40' S; 73° 03' W), South Bay Tumbes; ODHNER (1926): Melinka, Guaitecas Islands; SCHRÖDL (1996a): Bay Coliumo, Faro Corona, Seno Ventis-

quero; VALDÉS AND GOSLINER (2001): Península Lacuay, Chiloé Island; VALDÉS AND MUNIÁIN (2002): Lota, Peninsula Lacuay, Chiloé Island and ABRAHAM (1877): Strait of Magallanes.

General distribution: Apart from Chile, this species is also known from

Callao, Peru (DALL, 1909); Argentinian Patagonia (SCHRÖDL, 1996a, 2003) and Falklands Islands (ELIOT, 1907a).

Remarks: The generic status of the nominal species *Doris punctuolata* d'Orbigny, 1837 and *Anisodoris marmorata* Bergh, 1898 (non *Archidoris marmorata* Bergh, 1891) has received much atten-

tion (VALDÉS AND GOSLINER, 2001; VALDÉS AND MUNIÁIN, 2002; SCHRÖDL, 2003). Thus the former of this species was transferred to *Diaulula* recently by the above authors. On the other hand, the second species is transferred to *Peltodoris* Bergh, 1880 by VALDÉS AND MUNIÁIN (2002).

Diaulula variolata (d'Orbigny, 1837)

Material: El Tabo, V región (33° 27' S; 71° 38' W), four specimens (N° SSUC-32). El Tabo, Valparaíso, one specimen (N° SSUC-53). Iquique, one specimen (N° SSUC-3333).

Previous records from Chile: BERGH, (1898a): Bay of Coquimbo (29° 57' S; 71° 22' W); MARCUS (1959): Bay of San Vicente (36° 44' S; 73° 11' W), South-Eastern Punta Gualpén, northern Chile (36° 44' 54" S; 73° 11' 02" W); SCHRÖDL (1996a): Bay Inglesa, Los Hornos, Guanaqueros (30° 10' S; 71° 26' W), Bay of Coliumo; SCHRÖDL (1997): Bay Inglesa (27° 07' S; 70° 53' W); SCHRÖDL (2003): Arica (18° 25' S; 70° 16' W); VALDÉS AND MUNIÁIN (2002): Coquimbo and Lota.

General distribution: This species has not been recorded outside Chile.

Remarks: VALDÉS AND MUNIÁIN (2002) consider the nominal species *Doris variolata* d'Orbigny, 1837 within *Peltodoris*, but distinct from the nominal species *Anisodoris marmorata* Bergh, 1898. SCHRÖDL (2003) demonstrated that both species belong to the genus *Diaulula*, based on the presence of caryophyllidia on the notum, as well as that both are conspecific. The present study extends the known distribution of *D. variolata* much more northwards, up to Iquique.

Genus *Rostanga* Bergh, 1879

Rostanga pulchra MacFarland, 1905

Material: Totoralillo, two specimens (N° SSUC-938).

Previous records from Chile: MARCUS (1959): Playa Brava, Chiloé (41° 51' 35" S; 73° 49' 20" W), Punta El Morro, Ancud (41° 52' 42" S; 73° 50' 46" W); SCHRÖDL (1996a): Coliumo, Queule, Bay of Ancud, Faro Corona. The present study extends the geographical

range towards the northern Chilean coast.

General distribution: Also recorded from Alaska (LEE AND FOSTER, 1985) to Mexico (LANCE, 1966; MARCUS AND MARCUS, 1970). It has been also collected from Argentina (MARCUS AND MARCUS, 1969).

Family TRITONIIDAE Lamarck, 1809

Genus *Tritonia* Cuvier, 1797

Tritonia odhneri Marcus, 1959

Material: Mehuín (39° 26' S; 73° 12' W), one specimen (N° SSUC-2129). Dúo, one specimen (N° SSUC-577). Ensenada de Tumbes (36° 37' S; 73° 07' W), one specimen (N° SSUC-1381). Corral (32° 52' S; 73° 37' W), two specimens (N° SSUC-3807).

Previous records from Chile: Punta Tenaún, Gulf of Ancud (42° 20' S; 73° 22' W): MARCUS (1959); Bay of Coliumo, Queule (36° 32' S; 72° 57' W): SCHRÖDL, 1996a.

General distribution: This species has also been recorded from northern Argentina to southern Brazil (SCHRÖDL, 2003).

Family DOTOIDAE Gray, 1853

Genus *Doto* Oken, 1815

Doto uva Marcus, 1955

Material: Punta Blanca, Tocopilla (22° 04' S; 70° 12' W), one specimen (N° SSUC-3038).

Previous records from Chile: MARCUS (1959): Channel of Calbuco, Gulf of Ancud in Chile; SCHRÖDL (1997a): Bay of Coliumo. SCHRÖDL ET AL. (2005): Comau Fjord (42° 05' /42° 30' S; 72° 37' /72° 21' W). The pre-

sent study extends the geographical range towards the northern Chilean coast.

General distribution: This species is also known from Sao Paulo, Brazil (MARCUS, 1955, 1957, 1959).

Family FACELINIDAE Bergh, 1889

Genus *Phidiana* Gray, 1850

Phidiana lottini (Lesson, 1831)

Material: Duao, six specimens (N° SSUC-610). Caleta Leandro, Tumbes, one specimen (N° SSUC-1534). Yervas Buenas, Tumbes, four specimens (N° SSUC-1665). El Morro, Tomé (36° 37' S; 72° 57' W), four specimens (N° SSUC-1936). Mehuín, five specimens (N° SSUC-2129). Punta Moquehua, Caleta Mansa, eight specimens (N° SSUC-5279).

Previous records from Chile: LESSON (1831): San Vicente; PLATE (1894): Coquimbo; BERGH (1898): Coquimbo, Cavancha, Iquique; MARCUS (1959): Punta Liles in Gulf of San Vicente (36° 43' 36'' S; 73° 08' 10'' W), South-East Punta Ahui (41° 50' 10'' S; 73° 51' 20'' W); SCHRÖDL (1996a, 2003): Los Hornos (29° 38' S; 71° 29' W), Queule, Lenca (41°

40' S; 72° 40' W), Bay of Ancud (41° 52' S; 73° 55' W), Bay of Coliumo; SCHRÖDL ET AL. (2005): Comau Fjord (42° 05' /42° 30' S; 72° 37' /72° 21' W). Records from the Strait of Magellan are considered erroneous (SCHRÖDL, 2003).

General distribution: Apart from Chile, this species is also known from Callao, Peru (D'ORBIGNY, 1835-1846).

Family AEOLIDIIDAE d'Orbigny, 1834

Genus *Aeolidia* Cuvier, 1798

Aeolidia papillosa (Linnaeus, 1761)

Material: Los Molles, two specimens (N° SSUC-183). Los Morros, Coliumo, two specimens (N° SSUC-1113). Puerto Inglés, Tumbes (36° 37' S; 73° 07' W), six specimens (N° SSUC-1619). Traiguén, Tumbes, four specimens (N° SSUC-1743). El Morro, Tomé, one specimen (N° SSUC-1936). Punta Moquehua, Caleta Mansa, six specimens (N° SSUC-5279).

Previous records from Chile: BERGH (1898a): In the Magellanic province, Seno Almirantazgo; MARCUS (1959): North-West from Isote Quenu (41° 49' 15'' S, 73° 10'

15'' W), East from Punta Corona (41° 47' 12'' S, 73° 52' 23'' W), North from Isote Cochinos (41° 49' 25'' S, 73° 48' 58'' W), North from Gulf of Ancud between Tres

Cruces and Punta Piedras, Bay Tumbes and Punta María in Agua Fresca, Strait of Magellan (53° 22' S, 70° 57' W); SCHRÖDL (1996a): Faro Corona; SCHRÖDL (2003): Bay of Coliumo. With the present study the distribution has been markedly extended northwards, up to Los Molles.

General distribution: *Aeolidia papillosa* is a worldwide species in temperate waters (SCHRÖDL, 2003; THOMPSON AND BROWN, 1984). In southern America it has been also recorded from Falkland Islands (BERGH, 1898) and Argentinian Patagonia (SCHRÖDL, 1996a).

Family FIONIDAE Alder and Hancock, 1851

Genus *Fiona* Alder and Hancock, 1851

Fiona pinnata (Eschscholtz, 1831)

Material: Mehuín, Valdivia, two specimens (N° SSUC-2129).

Previous records from Chile: BERGH (1898a): Juan Fernández Islands and Tumbes, Talcahuano (Chile Central).

General distribution: *Fiona pinnata* is a cosmopolitan species (SCHMEKEL

AND PORTMANN, 1982; GOSLINER, 1987); recorded off northern Peru (D'ORBIGNY, 1835-46) and from Lobos Islands, northern Peru (SCHRÖDL, 1996a; 2003).

DISCUSSION

To date the number of known opisthobranchs in Chile amounts to 75 species distributed in 51 genera and 34 families, all of them recorded in Table II. The present study provides records of 18 opisthobranch species: 2 sacoglossan, 1 pleurobranchid and 16 nudibranchs, all previously known from Chile.

The Nudibranchia form the most diverse clade of opisthobranchs in Chile, consisting of 57 species. Among them *Thecacera darwini* is a well-known and very common species along the entire Chilean coast, just as *Phidiana lottini* and *Diaulula variolata*.

Chilean opisthobranch species descriptions too poor to warrant reidentification, or currently considered as *nomen dubium* or *nomen nudum*, are not included in Table II. These are: *Doris delicata* Abraham, 1877, *Doris tomentosa* Cuvier, 1804 (*sensu* Abraham, 1877), *Doris amarilla* Pöppig, 1829, *Doris magellanica* Cunningham, 1871, *Doris chilensis* Abraham, 1877 and *Acanthodoris vathelei* Rochebrune and Mabille, 1891. The holotype of the latter species has probably been mislaid (V. Heros, personal communication).

Eleven species reported in the literature are still unidentified: one sacoglossan (*Limapontia* sp., SCHRÖDL, 1999a) and ten nudibranchs (*Doris* sp., SCHRÖDL, 1996a; *Dendronotus* sp., SCHRÖDL, 1996a; *Tritonia* sp. 1, SCHRÖDL, 2003; *Flabellina* sp. 1, SCHRÖDL, 1996a, *Flabellina* sp. 2, SCHRÖDL, 1996a; *Eubranchus* sp. 1, SCHRÖDL, 1996a; *Eubranchus* sp. 2, SCHRÖDL, 1996a; *Cuthona* sp. 1, SCHRÖDL, 1996a; *Cuthona* sp. 2, SCHRÖDL, 1996a; *Tergipedidae* sp. 1, SCHRÖDL, 2003).

On the other hand, the opisthobranch collection of Couthouy reported on by GOULD (1852) has been lost. Due to the poor description of this material, both species *Doris luteola* Couthouy in Gould, 1852 *nomen dubium*, and *Doris plumulata* Couthouy in Gould, 1852 *nomen dubium* could not be included in Table II.

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